



#574B

SEQUENCE LISTING

<110> Dalemans, Wilfried L.J.
Gerard, Catherine Marie Ghislaine

<120> Vaccine

<130> B45124

<140> 09/581,976
<141> 2000-06-20

<150> PCT/EP98/08563
<151> 1998-12-18

<150> GB 9727262.9
<151> 1997-12-24

<160> 26

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<212> PRT
<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus
influenza B and E7 from Human papilloma virus type
16)

<400> 1

Met Asp Pro Ser Ser His Ser Ser Asn Met Ala Asn Thr Gln Met Lys
1 5 10 15
Ser Asp Lys Ile Ile Ala His Arg Gly Ala Ser Gly Tyr Leu Pro
20 25 30
Glu His Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln Ala Asp
35 40 45
Tyr Leu Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu Val Val
50 55 60

Ile His Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys Lys Phe
 65 70 75 80
 Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp Phe Thr
 85 90 95
 Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met
 100 105 110
 Ala Met His Gly Asp Thr Pro Thr Leu His Glu Tyr Met Leu Asp Leu
 115 120 125
 Gln Pro Glu Thr Thr Asp Leu Tyr Cys Tyr Glu Gln Leu Asn Asp Ser
 130 135 140
 Ser Glu Glu Glu Asp Glu Ile Asp Gly Pro Ala Gly Gln Ala Glu Pro
 145 150 155 160
 Asp Arg Ala His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser
 165 170 175
 Thr Leu Arg Leu Cys Val Gln Ser Thr His Val Asp Ile Arg Thr Leu
 180 185 190
 Glu Asp Leu Leu Met Gly Thr Leu Gly Ile Val Cys Pro Ile Cys Ser
 195 200 205
 Gln Lys Pro Thr Ser Gly His His His His His His
 210 215 220

<210> 2

<211> 663

<212> DNA

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and E7 from Human papilloma virus type 16)

<400> 2

atggatccaa gcagcgattc atcaaatacg ggcataaccc aaatgaaatc agacaaaatc 60
 attattgctc accgtgggtgc tagcggttat ttaccagagc atacgttaga atctaaagca 120
 cttgcgtttg cacaacagggc tgattactta gagcaagatt tagcaatgac taaggatgg 180
 cgtttagtgg ttattcaca tcactttt gatggcttga ctgatgttgc gaaaaaattc 240
 ccacatcgatc atcgtaaaga tggcggttac tatgtcatcg actttacctt aaaagaaaatt 300
 caaagtttag aaatgacaga aaacatttgaa accatggcca tgcattggaga tacacccata 360
 ttgcattaat atatgtttaga ttgtcaacca gagacaactg atctctactg ttatgagcaa 420
 ttaaatgaca gctcagagga ggaggatgaa atagatggtc cagctggaca agcagaaccg 480
 gacagagccc attacaatat ttgtacccat ttgttgcatt gtgactctac gcttcgggtt 540
 tgcgtacaaa gcacacacgt agacattcgt actttggaa acctgttaat gggcacacta 600
 ggaattgtgt gccccatctg ttctcagaaa ccaactagtg gccatccatca ccatcaccat 660

taa

663

<210> 3
<211> 822
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimaeric protein (protein D from Haemophilus
influenza B and E6 from Human papilloma virus type
16)

<400> 3

ATGGATCAA GCAGCCATT	ATCAAATATG GCGAATACCC	AAATGAAATC AGACAAAATC	60
ATTATTGCTC ACCGTGGTGC	TAGCGGTTAT TTACCAAGAGC	ATACGTTAGA ATCTAAAGCA	120
CTTGCCTTG CACAACAGGC	TGATTATTTA GAGCAAGATT	TAGCAATGAC TAAGGATGGT	180
CGTTTAGTGG TTATTCACGA	TCACTTTTA GATGGCTTGA	CTGATGTTGC GAAAAAAATTC	240
CCACATCGTC ATCGTAAAGA	TGGCCGTTAC TATGTCATCG	ACTTTACCTT AAAAGAAATT	300
CAAAGTTTAG AAATGACAGA	AAACTTTGAA ACCATGGCCA	TGTTTCAGGA CCCACAGGAG	360
CGACCCAGAA AGTTACCACA	GTTATGCACA GAGCTGAAA	CAACTATACA TGATATAATA	420
TTAGAATGTG TGTACTGCAA	GCAACAGTTA CTGCGACGTG	AGGTATATGA CTTTGCTTT	480
CGGGATTAT GCATAGTATA	TAGAGATGGG AATCCATATG	CTGTATGTGA TAAATGTTA	540
AAGTTTTATT CTAAAATTAG	TGAGTATAGA CATTATGTT	ATAGTTGTA TGGAACAACA	600
TTAGAACAGC AATACAACAA	ACCGTTGTGT GATTGTTAA	TTAGGTGTAT TAACTGTCAA	660
AAGCCATGTG GTCCTGAAGA	AAAGCAAAGA CATCTGGACA	AAAAGCAAAG ATTCCATAAT	720
ATAAGGGGTC GGTGGACCGG	TCGATGTATG TCTTGTGCA	GATCATCAAG AACACGTAGA	780
GAAACCCAGC TGACTAGTGG	CCACCATCAC CATCACATT AA		822

<210> 4
<211> 273
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimaeric protein (protein D from Haemophilus
influenza B and E6 from Human papilloma virus type
16)

<400> 4

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
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Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro

20	25	30	
Glu His Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln Ala Asp			
35	40	45	
Tyr Leu Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu Val Val			
50	55	60	
Ile His Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys Lys Phe			
65	70	75	80
Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp Phe Thr			
85	90	95	
Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met			
100	105	110	
Ala Met Phe Gln Asp Pro Gln Glu Arg Pro Arg Lys Leu Pro Gln Leu			
115	120	125	
Cys Thr Glu Leu Gln Thr Thr Ile His Asp Ile Ile Leu Glu Cys Val			
130	135	140	
Tyr Cys Lys Gln Gln Leu Leu Arg Arg Glu Val Tyr Asp Phe Ala Phe			
145	150	155	160
Arg Asp Leu Cys Ile Val Tyr Arg Asp Gly Asn Pro Tyr Ala Val Cys			
165	170	175	
Asp Lys Cys Leu Lys Phe Tyr Ser Lys Ile Ser Glu Tyr Arg His Tyr			
180	185	190	
Cys Tyr Ser Leu Tyr Gly Thr Thr Leu Glu Gln Gln Tyr Asn Lys Pro			
195	200	205	
Leu Cys Asp Leu Leu Ile Arg Cys Ile Asn Cys Gln Lys Pro Leu Cys			
210	215	220	
Pro Glu Glu Lys Gln Arg His Leu Asp Lys Lys Gln Arg Phe His Asn			
225	230	235	240
Ile Arg Gly Arg Trp Thr Gly Arg Cys Met Ser Cys Cys Arg Ser Ser			
245	250	255	
Arg Thr Arg Arg Glu Thr Gln Leu Thr Ser Gly His His His His His			
260	265	270	

His

<210> 5

<211> 1116

<212> DNA

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and E6E7 fusion from Human papilloma virus type 16)

<400> 5

atggatccaa	gcagccattc	atcaaataatg	gcgaataaccc	aatgaaatc	agacaaaatc	60
attattgctc	accgtggtgc	tagcggttat	ttaccagagc	atacgttaga	atctaaagca	120
cttgcgttgc	cacaacagggc	tgattattta	gagcaagatt	tagcaatgac	taaggatggt	180
cgttttagtgg	ttatttcacga	tcactttta	gatggcttga	ctgatgttgc	gaaaaaattc	240
ccacatcgtc	atcgtaaaga	tggccgttac	tatgtcatcg	actttacctt	aaaagaaaatt	300
caaagtttag	aaatgacaga	aaactttgaa	accatggcca	tgtttcagga	cccacaggag	360
cgacccagaa	agtttaccaca	gttatgcaca	gagctgc当地	caactataca	tgatataata	420
tttagaatgtg	tgtactgcaa	gcaacagttt	ctgcgacgtg	aggtatatga	ctttgctttt	480
cgggattttat	gcatagttata	tagagatggg	aatccatatg	ctgtatgtga	taaatgttta	540
aagttttattt	ctaaaatttag	tgagttataga	cattattgtt	atagtttgc当地	tggaaacaaca	600
tttagaacagc	aatacacaacaa	accgttgtgt	gatttgc当地	ttaggtgtat	taactgtcaa	660
aagccactgt	gtcctgaaga	aaagcaaaga	catctggaca	aaaagcaaag	attccataat	720
ataaggggtc	ggtggaccgg	tcgatgtatg	tcttgc当地	gatcatcaag	aacacgtaga	780
gaaaccgcagc	tgatgc当地	agatacacct	acattgc当地	aatatatgtt	agatttgc当地	840
ccagagacaa	ctgatctcta	ctgttatgag	caattaaatg	acagctcaga	ggaggaggat	900
gaaatagatg	gtccagctgg	acaagcagaa	ccggacagag	cccattacaa	tattgttacc	960
ttttgttgc当地	agtgtgactc	tacgttgc当地	ttgtgc当地	aaagcacaca	cgtagacatt	1020
cgtactttgg	aagacctgtt	aatgggcaca	ctaggaatttgc当地	ttgtgc当地	ctgttctc当地	1080
aaacccaacta	gtggccacca	tcaccatcac	cattaa			1116

<210> 6

211 371

<212> PRT

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from ~~Haemophilus~~
influenza B and E6E7 fusion from Human papilloma
virus type 16)

<400> 6

Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp Phe Thr
85 90 95
Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met
100 105 110
Ala Met Phe Gln Asp Pro Gln Glu Arg Pro Arg Lys Leu Pro Gln Leu
115 120 125
Cys Thr Glu Leu Gln Thr Thr Ile His Asp Ile Ile Leu Glu Cys Val
130 135 140
Tyr Cys Lys Gln Gln Leu Leu Arg Arg Glu Val Tyr Asp Phe Ala Phe
145 150 155 160
Arg Asp Leu Cys Ile Val Tyr Arg Asp Gly Asn Pro Tyr Ala Val Cys
165 170 175
Asp Lys Cys Leu Lys Phe Tyr Ser Lys Ile Ser Glu Tyr Arg His Tyr
180 185 190
Cys Tyr Ser Leu Tyr Gly Thr Thr Leu Glu Gln Gln Tyr Asn Lys Pro
195 200 205
Leu Cys Asp Leu Leu Ile Arg Cys Ile Asn Cys Gln Lys Pro Leu Cys
210 215 220
Pro Glu Glu Lys Gln Arg His Leu Asp Lys Lys Gln Arg Phe His Asn
225 230 235 240
Ile Arg Gly Arg Trp Thr Gly Arg Cys Met Ser Cys Cys Arg Ser Ser
245 250 255
Arg Thr Arg Arg Glu Thr Gln Leu Met His Gly Asp Thr Pro Thr Leu
260 265 270
His Glu Tyr Met Leu Asp Leu Gln Pro Glu Thr Thr Asp Leu Tyr Cys
275 280 285
Tyr Glu Gln Leu Asn Asp Ser Ser Glu Glu Asp Glu Ile Asp Gly
290 295 300
Pro Ala Gly Gln Ala Glu Pro Asp Arg Ala His Tyr Asn Ile Val Thr
305 310 315 320
Phe Cys Cys Lys Cys Asp Ser Thr Leu Arg Leu Cys Val Gln Ser Thr
325 330 335
His Val Asp Ile Arg Thr Leu Glu Asp Leu Leu Met Gly Thr Leu Gly
340 345 350
Ile Val Cys Pro Ile Cys Ser Gln Lys Pro Thr Ser Gly His His His
355 360 365
His His His
370

<210> 7
<211> 663
<212> DNA
<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and mutated E7 from Human papilloma virus type 16)

<400> 7

atggatccaa	gcagccattc	atcaaataatg	gcgaataaccc	aatgaaatc	agacaaaatc	60
attattgctc	accgtggtgc	tagcggttat	ttaccagagc	atacgttaga	atctaaagca	120
cttgcgtttg	cacaacaggc	tgattattta	gagcaagatt	tagcaatgac	taaggatgg	180
cgttttagtgg	ttattcacga	tcactttta	gatggcttga	ctgatgttc	gaaaaaaattc	240
ccacatcgtc	atcgtaaaga	tggccgttac	tatgtcatcg	actttacctt	aaaagaaaatt	300
caaagtttag	aaatgacaga	aaactttgaa	accatggcca	tgcatggaga	tacacctaca	360
ttgcatgaat	atatgttaga	tttgcacca	gagacaactg	atctctacgg	ttatcagcaa	420
ttaaatgaca	gctcagagga	ggaggatgaa	atagatggc	cagctggaca	agcagaaccg	480
gacagagccc	attacaatat	tgtaacctt	tgttgcaagt	gtgactctac	gcttcgggtt	540
tgcgtacaaa	gcacacacgt	agacattcgt	actttggaa	acctgttaat	gggcacacta	600
ggaatttgtt	gccccatctg	ttctcagaaa	ccaaactagtg	gccaccatca	ccatcaccat	660
taa						663

<210> 8

<211> 220

<212> PRT

<213> Artificial Sequence

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<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and mutated E7 from Human papilloma virus type 16)

<400> 8

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys	
1									10					15		
Ser	Asp	Lys	Ile	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20						25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp	
			35						40					45		
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val	
			50						55					60		
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe	
			65						70					75		80
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr	
									85					90		95

Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
100						105				110					
Ala	Met	His	Gly	Asp	Thr	Pro	Thr	Leu	His	Glu	Tyr	Met	Leu	Asp	Leu
115						120				125					
Gln	Pro	Glu	Thr	Thr	Asp	Leu	Tyr	Gly	Tyr	Gln	Gln	Leu	Asn	Asp	Ser
130						135				140					
Ser	Glu	Glu	Glu	Asp	Glu	Ile	Asp	Gly	Pro	Ala	Gly	Gln	Ala	Glu	Pro
145						150				155			160		
Asp	Arg	Ala	His	Tyr	Asn	Ile	Val	Thr	Phe	Cys	Cys	Lys	Cys	Asp	Ser
165						170				175					
Thr	Leu	Arg	Leu	Cys	Val	Gln	Ser	Thr	His	Val	Asp	Ile	Arg	Thr	Leu
180						185				190					
Glu	Asp	Leu	Leu	Met	Gly	Thr	Leu	Gly	Ile	Val	Cys	Pro	Ile	Cys	Ser
195						200				205					
Gln	Lys	Pro	Thr	Ser	Gly	His	His	His	His						
210						215				220					

<210> 9

<211> 879

<212> DNA

<213> Artificial Sequence

<220>

<223> Chimaeric protein (Clyta from Streptococcus pneumoniae and E6 from Human papilloma virus type 16)

<400> 9

atgaaagggg	gaatttgtaca	ttcagacggc	tcttatccaa	aagacaagtt	tgagaaaatc	60
aatggcactt	ggtactactt	tgacagttca	ggctatatgc	ttgcagaccg	ctggaggaag	120
cacacagacg	gcaactggta	ctggttcgac	aactcaggcg	aaatggctac	aggctggaag	180
aaaatcgctg	ataagtggta	ctatttcaac	gaagaagggt	ccatgaagac	aggctgggtc	240
aagtacaagg	acacttggta	ctacttagac	ctctaaagaag	gcccctatgg	atcaaattgc	300
tttatccagt	cagcggacgg	aacaggctgg	tactacctca	aaccagacgg	aacactggca	360
gacaggccag	aattggccag	catgctggac	atggccatgt	ttcaggaccc	acaggagcga	420
cccgaaagt	taccacagtt	atgcacagag	ctgcaaaacaa	ctatacatga	tataatatta	480
gaatgtgtgt	actgcaagca	acagttactg	cgacgtgagg	tatatgactt	tgctttcgg	540
gatttatgca	tagtatata	agatggaaat	ccatatgctg	tatgtgataa	atgtttaaag	600
ttttattctta	aaattagtga	gtatagacat	tattgttata	gtttgtatgg	aacaacatta	660
gaacagcaat	acaacaaacc	gttgtgtgat	ttgttaatta	ggtgtattaa	ctgtcaaaag	720
ccactgtgtc	ctgaagaaaa	gcaaagacat	ctggacaaaa	agcaaagatt	ccataatata	780
aggggtcggt	ggaccggctcg	atgtatgtct	ttttgcagat	catcaagaac	acgttagagaa	840
acccagctga	ctagtggcca	ccatcacat	caccattaa			879

<210> 10
<211> 292
<212> PRT
<213> ChArtificial Sequence

<220>
<223> Chimaeric protein (Clyta from Streptococcus pneumoniae and E6 from Human papilloma virus type 16)

<400> 10
Met Lys Gly Gly Ile Val His Ser Asp Gly Ser Tyr Pro Lys Asp Lys
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Phe Glu Lys Ile Asn Gly Thr Trp Tyr Tyr Phe Asp Ser Ser Gly Tyr
20 25 30
Met Leu Ala Asp Arg Trp Arg Lys His Thr Asp Gly Asn Trp Tyr Trp
35 40 45
Phe Asp Asn Ser Gly Glu Met Ala Thr Gly Trp Lys Lys Ile Ala Asp
50 55 60
Lys Trp Tyr Tyr Phe Asn Glu Glu Gly Ala Met Lys Thr Gly Trp Val
65 70 75 80
Lys Tyr Lys Asp Thr Trp Tyr Tyr Leu Asp Ala Lys Glu Gly Ala Met
85 90 95
Val Ser Asn Ala Phe Ile Gln Ser Ala Asp Gly Thr Gly Trp Tyr Tyr
100 105 110
Leu Lys Pro Asp Gly Thr Leu Ala Asp Arg Pro Glu Leu Ala Ser Met
115 120 125
Leu Asp Met Ala Met Phe Gln Asp Pro Gln Glu Arg Pro Arg Lys Leu
130 135 140
Pro Gln Leu Cys Thr Glu Leu Gln Thr Thr Ile His Asp Ile Ile Leu
145 150 155 160
Glu Cys Val Tyr Cys Lys Gln Gln Leu Leu Arg Arg Glu Val Tyr Asp
165 170 175
Phe Ala Phe Arg Asp Leu Cys Ile Val Tyr Arg Asp Gly Asn Pro Tyr
180 185 190
Ala Val Cys Asp Lys Cys Leu Lys Phe Tyr Ser Lys Ile Ser Glu Tyr
195 200 205
Arg His Tyr Cys Tyr Ser Leu Tyr Gly Thr Thr Leu Glu Gln Gln Tyr
210 215 220
Asn Lys Pro Leu Cys Asp Leu Leu Ile Arg Cys Ile Asn Cys Gln Lys
225 230 235 240
Pro Leu Cys Pro Glu Glu Lys Gln Arg His Leu Asp Lys Lys Gln Arg

245 250 255
Phe His Asn Ile Arg Gly Arg Trp Thr Gly Arg Cys Met Ser Cys Cys
260 265 270
Arg Ser Ser Arg Thr Arg Arg Glu Thr Gln Leu Thr Ser Gly His His
275 280 285
His His His His
290

<210> 11
<211> 720
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimaeric protein (Clyta from Streptococcus pneumoniae and E7 from Human papilloma virus type 16)

<400> 11

atgaaagggg	gaatttgtaca	ttcagacggc	tcttatccaa	aagacaagtt	tgagaaaatc	60
aatggcactt	ggtactactt	tgacagttca	ggcttatatgc	ttgcagaccg	ctggaggaag	120
cacacagacg	gcaactggta	ctgggtcgac	aactcaggcg	aaatggctac	aggctggaaag	180
aaaatcgctg	ataagtggta	ctatttcaac	gaagaagggtg	ccatgaagac	aggctgggtc	240
aagtacaagg	acacttggta	ctacttagac	gctaaagaag	gcccattgtt	atcaaattgcc	300
tttatccagt	cagcggacgg	aacaggctgg	tactacctca	aaccagacgg	aacactggca	360
gacaggccag	aattggccag	catgctggac	atggccatgc	atggagatac	acctacattg	420
catgaatata	tgttagattt	gcaaccagag	acaactgatc	tctactgtta	ttagcaattt	480
aatgacagct	cagaggagga	ggtatggaaata	gatggtccag	ctggacaagc	agaaccggac	540
agagcccatt	acaatattgt	aacctttgt	tccaaatgtg	actctacgct	tcgggtgtgc	600
gtacaaagca	cacacgtaga	cattcgtaact	ttggaaagacc	tgttaatggg	cacacttagga	660
attgtgtgcc	ccatctgttc	tcagaaacca	actaattggcc	accatcacca	tcaccattaa	720

<210> 12
<211> 239
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimaeric protein (Clyta from Streptococcus pneumoniae and E7 from Human papilloma virus type 16)

<400> 12

Met	Lys	Gly	Gly	Ile	Val	His	Ser	Asp	Gly	Ser	Tyr	Pro	Lys	Asp	Lys
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Phe	Glu	Lys	Ile	Asn	Gly	Thr	Trp	Tyr	Tyr	Phe	Asp	Ser	Ser	Gly	Tyr
						25						30			
Met	Leu	Ala	Asp	Arg	Trp	Arg	Lys	His	Thr	Asp	Gly	Asn	Trp	Tyr	Trp
						40						45			
Phe	Asp	Asn	Ser	Gly	Glu	Met	Ala	Thr	Gly	Trp	Lys	Lys	Ile	Ala	Asp
						55						60			
Lys	Trp	Tyr	Tyr	Phe	Asn	Glu	Gly	Ala	Met	Lys	Thr	Gly	Trp	Val	
						70					75				80
Lys	Tyr	Lys	Asp	Thr	Trp	Tyr	Tyr	Leu	Asp	Ala	Lys	Glu	Gly	Ala	Met
						85					90				95
Val	Ser	Asn	Ala	Phe	Ile	Gln	Ser	Ala	Asp	Gly	Thr	Gly	Trp	Tyr	Tyr
						100					105				110
Leu	Lys	Pro	Asp	Gly	Thr	Leu	Ala	Asp	Arg	Pro	Glu	Leu	Ala	Ser	Met
						115					120				125
Leu	Asp	Met	Ala	Met	His	Gly	Asp	Thr	Pro	Thr	Leu	His	Glu	Tyr	Met
						130					135				140
Leu	Asp	Leu	Gln	Pro	Glu	Thr	Asp	Leu	Tyr	Cys	Tyr	Glu	Gln	Leu	
						145					150				160
Asn	Asp	Ser	Ser	Glu	Glu	Glu	Asp	Glu	Ile	Asp	Gly	Pro	Ala	Gly	Gln
						165					170				175
Ala	Glü	Pro	Asp	Arg	Ala	His	Tyr	Asn	Ile	Val	Thr	Phe	Cys	Cys	Lys
						180					185				190
Cys	Asp	Ser	Thr	Leu	Arg	Leu	Cys	Val	Gln	Ser	Thr	His	Val	Asp	Ile
						195					200				205
Arg	Thr	Leu	Glu	Asp	Leu	Leu	Met	Gly	Thr	Leu	Gly	Ile	Val	Cys	Pro
						210					215				220
Ile	Cys	Ser	Gln	Lys	Pro	Thr	Ser	Gly	His	His	His	His	His	His	
						225					230				235

<210> 13
 <211> 1173
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Chimaeric protein (Clyta from Streptococcus pneumoniae and E6E7 fusion from Human papilloma virus type 16)

<400> 13

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aatggcactt	ggtactactt	tgacagttca	ggctataatgc	ttgcagaccg	ctggaggaag	120
cacacagacg	gcaactggta	ctgggtcgac	aactcagggcg	aatggctac	aggctggaaag	180
aaaatcgctg	ataagtggta	ctatttcaac	gaagaaggcg	ccatgaagac	aggctgggtc	240
aagtacaagg	acacttggta	ctacttagac	gctaaagaag	gccccatggt	atcaaatgcc	300
tttatccagt	cagcggacgg	aacaggctgg	tactacctca	aaccagacgg	aacactggca	360
gacaggccag	aattggccag	catgctggac	atggccatgt	ttcaggaccc	acaggagcga	420
cccagaaaagt	taccacagtt	atgcacagag	ctgcaaacaa	ctatacatga	tataatatta	480
gaatgtgtgt	actgcaagca	acagttactg	cgacgtgagg	tatatgactt	tgcttttcgg	540
gatttatgca	tagtatata	agatggaaat	ccatatgctg	tatgtataa	atgtttaaag	600
ttttatttcta	aaatttagtga	gtatagacat	tattgttata	gtttgtatgg	aacaacatta	660
gaacagcaat	acaacaaacc	gttgtgtat	ttgttaatta	ggtgtattaa	ctgtcaaaag	720
ccactgtgtc	ctgaagaaaa	gcaaagacat	ctggacaaaa	agcaaagatt	ccataatata	780
aggggtcggt	ggaccgggtcg	atgtatgtct	tgttgcagat	catcaagaac	acgtagagaa	840
acccagctga	tgcattggaga	tacacctaca	ttgcattaat	atatgttata	tttgcaccca	900
gagacaactg	atctctactg	ttatgagcaa	ttaaatgaca	gctcagagga	ggaggatgaa	960
atagatggtc	cagctggaca	agcagaaccg	gacagagccc	attacaatat	tgtaacccccc	1020
tgttgcattgt	gtgactctac	gcttcgggtt	tgcgtadaaa	gcacacacgt	agacattcgt	1080
actttggaag	acctgttaat	gggcacacta	ggaattgtgt	gccccatctg	ttctcagaaaa	1140
ccaaactagtg	gccaccatca	ccatcaccat	taa			1173

<210> 14

<211> 390

<212>, PRT

<213> Artificial Sequence

1

<220>

<223> Chimaeric protein (Clyta from Streptococcus pneumoniae and E6E7 fusion from Human papilloma virus type 16)

<400> 14

Met	Lys	Gly	Gly	Ile	Val	His	Ser	Asp	Gly	Ser	Tyr	Pro	Lys	Asp	Lys
1				5					10				15		
Phe	Glu	Lys	Ile	Asn	Gly	Thr	Trp	Tyr	Tyr	Phe	Asp	Ser	Ser	Gly	Tyr
								20	25				30		
Met	Leu	Ala	Asp	Arg	Trp	Arg	Lys	His	Thr	Asp	Gly	Asn	Trp	Tyr	Trp
								35	40				45		
Phe	Asp	Asn	Ser	Gly	Glu	Met	Ala	Thr	Gly	Trp	Lys	Lys	Ille	Ala	Asp
					50			55			60				
Lys	Trp	Tyr	Tyr	Phe	Asn	Glu	Glu	Gly	Ala	Met	Lys	Thr	Gly	Trp	Val
								65	70		75		80		
Lys	Tyr	Lys	Asp	Thr	Trp	Tyr	Tyr	Leu	Asp	Ala	Lys	Glu	Gly	Ala	Met
								85	90				95		

Val Ser Asn Ala Phe Ile Gln Ser Ala Asp Gly Thr Gly Trp Tyr Tyr
100 105 110
Leu Lys Pro Asp Gly Thr Leu Ala Asp Arg Pro Glu Leu Ala Ser Met
115 120 125
Leu Asp Met Ala Met Phe Gln Asp Pro Gln Glu Arg Pro Arg Lys Leu
130 135 140
Pro Gln Leu Cys Thr Glu Leu Gln Thr Thr Ile His Asp Ile Ile Leu
145 150 155 160
Glu Cys Val Tyr Cys Lys Gln Gln Leu Leu Arg Arg Glu Val Tyr Asp
165 170 175
Phe Ala Phe Arg Asp Leu Cys Ile Val Tyr Arg Asp Gly Asn Pro Tyr
180 185 190
Ala Val Cys Asp Lys Cys Leu Lys Phe Tyr Ser Lys Ile Ser Glu Tyr
195 200 205
Arg His Tyr Cys Tyr Ser Leu Tyr Gly Thr Thr Leu Glu Gln Gln Tyr
210 215 220
Asn Lys Pro Leu Cys Asp Leu Leu Ile Arg Cys Ile Asn Cys Gln Lys
225 230 235 240
Pro Leu Cys Pro Glu Glu Lys Gln Arg His Leu Asp Lys Lys Gln Arg
245 250 255
Phe His Asn Ile Arg Gly Arg Trp Thr Gly Arg Cys Met Ser Cys Cys
260 265 270
Arg Ser Ser Arg Thr Arg Arg Glu Thr Gln Leu Met His Gly Asp Thr
275 280 285
Pro Thr Leu His Glu Tyr Met Leu Asp Leu Gln Pro Glu Thr Thr Asp
290 295 300
Leu Tyr Cys Tyr Glu Gln Leu Asn Asp Ser Ser Glu Glu Asp Glu
305 310 315 320
Ile Asp Gly Pro Ala Gly Gln Ala Glu Pro Asp Arg Ala His Tyr Asn
325 330 335
Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr Leu Arg Leu Cys Val
340 345 350
Gln Ser Thr His Val Asp Ile Arg Thr Leu Glu Asp Leu Leu Met Gly
355 360 365
Thr Leu Gly Ile Val Cys Pro Ile Cys Ser Gln Lys Pro Thr Ser Gly
370 375 380
His His His His His
385 390

<210> 15
<211> 684
<212> DNA
<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and E7 from Human papilloma virus type 18)

<400> 15

atggatccaa	gcagccattc	atcaaataatg	gcgaatacc	aatgaaaatc	agacaaaatc	60
attattgctc	accgtgggtgc	tagcggttat	ttaccagagc	atacgttaga	atctaaagca	120
cttgcgtttg	cacaacaggc	tgattattta	gagcaagatt	tagcaatgac	taaggatgg	180
cgttttagtgg	ttattcacga	tcactttta	gatggcttga	ctgatgtgc	gaaaaaattc	240
ccacatcgtc	atcgtaaaaga	tggccgttac	tatgtcatcg	actttacctt	aaaagaaaatt	300
caaagtttag	aaatgacaga	aaacttgaa	accatggcca	tgcatggacc	taaggcaaca	360
ttgcaagaca	ttgtattgca	tttagagccc	caaaatgaaa	ttcccggttga	ccttctatgt	420
cacgagcaat	taagcgactc	agaggaagaa	aacgatgaaa	tagatgaagt	taatcatcaa	480
catttaccag	cccgacgagc	cgaaccacaa	cgtcacacaa	tgttgtgtat	gtgttgtaag	540
tgtgaagcca	gaatttagct	agtagtagaa	agtcagcag	acgacccctcg	agcattccag	600
cagctgtttc	tgaacaccct	gtcctttgt	tgtccgttgt	gtgcatccca	gcagactagt	660
ggccaccatc	accatcacca	ttaa				684

<210> 16

<211> 227

<212> PRT

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and E7 from Human papilloma virus type 18)

<400> 16

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys	
1									10					15		
Ser	Asp	Lys	Ile	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
									25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp	
									40					45		
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val	
									55					60		
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe	
									70					75		80
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr	
									85					90		95

Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met
100 105 110
Ala Met His Gly Pro Lys Ala Thr Leu Gln Asp Ile Val Leu His Leu
115 120 125
Glu Pro Gln Asn Glu Ile Pro Val Asp Leu Leu Cys His Glu Gln Leu
130 135 140
Ser Asp Ser Glu Glu Asn Asp Glu Ile Asp Glu Val Asn His Gln
145 150 155 160
His Leu Pro Ala Arg Arg Ala Glu Pro Gln Arg His Thr Met Leu Cys
165 170 175
Met Cys Cys Lys Cys Glu Ala Arg Ile Glu Leu Val Val Glu Ser Ser
180 185 190
Ala Asp Asp Leu Arg Ala Phe Gln Gln Leu Phe Leu Asn Thr Leu Ser
195 200 205
Phe Val Cys Pro Trp Cys Ala Ser Gln Gln Thr Ser Gly His His His
210 215 220
His His His
225

<210> 17
<211> 109
<212> PRT
<213> Escherichia coli

<400> 17

Met Ser Asp Lys Ile Ile His Leu Thr Asp Asp Ser Phe Asp Thr Asp
1 5 10 15
Val Leu Lys Ala Asp Gly Ala Ile Leu Val Asp Phe Trp Ala Glu Trp
20 25 30
Cys Gly Pro Cys Lys Met Ile Ala Pro Ile Leu Asp Glu Ile Ala Asp
35 40 45
Glu Tyr Gln Gly Lys Leu Thr Val Ala Lys Leu Asn Ile Asp Gln Asn
50 55 60
Pro Gly Thr Ala Pro Lys Tyr Gly Ile Arg Gly Ile Pro Thr Leu Leu
65 70 75 80
Leu Phe Lys Asn Gly Glu Val Ala Ala Thr Lys Val Gly Ala Leu Ser
85 90 95
Lys Gly Gln Leu Lys Glu Phe Leu Asp Ala Asn Leu Ala
100 105

<210> 18
<211> 684
<212> DNA

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and mutated E7 from Human papilloma virus type 18)

<400> 18

atggatccaa	gcagccattc	atcaaataatg	gcgaatacc	aatgaaaatc	agacaaaatc	60
attattgctc	accgtggtgc	tagcggttat	ttaccagagc	atacgtaga	atctaaagca	120
cttgcgtttg	cacaacaggc	tgattattta	gagcaagatt	tagcaatgac	taaggatgg	180
cgttagtgg	ttattcacga	tcactttta	gatggcttga	ctgatgttgc	aaaaaaattc	240
ccacatcgtc	atcgtaaaga	tggccgttac	tatgtcatcg	actttacctt	aaaagaaatt	300
caaagtttag	aatgacaga	aaactttgaa	accatggcca	tgcattggacc	taaggcaaca	360
ttgcaagaca	ttgtattgca	tttagagccc	caaaatgaaa	ttccgggttga	ccttcttaggt	420
caccagcaat	taagcgactc	agaggaagaa	aacgatgaaa	tagatggagt	taatcatcaa	480
catttaccag	cccgacgagc	cgaaccacaa	cgtcacacaa	tgttggttat	gtgttgtaag	540
tgtgaagcca	gaatttgagct	agttagtagaa	agctcagcag	acgacccctcg	agcattccag	600
cagctgttcc	tgaacaccct	gtcctttgtg	tgtccgttgt	gtgcatccca	gcagactagt	660
ggccaccatc	accatcacca	ttaa				684

<210> 19

<211> 227

<212> PRT

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and mutated E7 from Human papilloma virus type 18)

<400> 19

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
1									10					15	
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20					25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
			35					40				45			
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
			50					55				60			
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
			65					70				75			80
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr

85	90	95	
Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met			
100	105	110	
Ala Met His Gly Pro Lys Ala Thr Leu Gln Asp Ile Val Leu His Leu			
115	120	125	
Glu Pro Gln Asn Glu Ile Pro Val Asp Leu Leu Gly His Gln Gln Leu			
130	135	140	
Ser Asp Ser Glu Glu Asn Asp Glu Ile Asp Gly Val Asn His Gln			
145	150	155	160
His Leu Pro Ala Arg Arg Ala Glu Pro Gln Arg His Thr Met Leu Cys			
165	170	175	
Met Cys Cys Lys Cys Glu Ala Arg Ile Glu Leu Val Val Glu Ser Ser			
180	185	190	
Ala Asp Asp Leu Arg Ala Phe Gln Gln Leu Phe Leu Asn Thr Leu Ser			
195	200	205	
Phe Val Cys Pro Trp Cys Ala Ser Gln Gln Thr Ser Gly His His His			
210	215	220	
His His His			
225			

<210> 20

<211> 837

<212> DNA

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza virus B and E6 from Human papilloma virus type 18)

<400> 20

atggatccaa gcagccattc atcaaatatg	gcgaatccaaatgaaatgaaatc	agacaaaatc	60
attattgctc accgtgggtgc tagcggttat	ttacccatgcgatcgtttaga	atctaaagca	120
cttgcgtttg cacaacaggc tgattattta	gagcaagatt	tagcaatgac	180
cgttttagtgg ttattcacga tcactttta	gatggcttga	ctgatgttgc	240
ccacatcgtc atcgtaaaga tggccgttac	tatgtcatcg	actttacctt	300
caaagtttag aatgacaga aaactttgaa	accatggcgc	aaaagaaaatt	360
cgaccctaca agctacactga tctgtgcacg	gaactgaaca	cttcactgca	420
ataacctgtg tatattgcaa gacagtattt	gaacttacag	aggtatttga	480
aaagattttat ttgtgggtgtat	tagagacagt	ataccgcattg	540
gatttttatt ctagaatttag agaattaaga	cattattttag	actctgtgtat	600
ttggaaaaac taactaacac tgggttatac	aatttattaa	taaggtgcct	660
aaaccgttga atccagcaga aaaactttaga	caccttaatg	gcggtgccag	
		atttcacaac	720

atacgctggc actatagagg ccagtccat tcgtgctgca accgagcacg acaggaacga 780
ctccaaacgac gcagagaaac acaagtaact agtggccacc atcaccatca ccattaa 837

<210> 21

<211> 278

<212> PRT

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus
influenza B and E6 from Human papilloma virus type
18)

<400> 21

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
1									10					15	
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20					25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
								35		40			45		
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
								50		55			60		
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
								65		70		75		80	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
								85		90			95		
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
								100		105			110		
Ala	Arg	Phe	Glu	Asp	Pro	Thr	Arg	Arg	Pro	Tyr	Lys	Leu	Pro	Asp	Leu
								115		120			125		
Cys	Thr	Glu	Leu	Asn	Thr	Ser	Leu	Gln	Asp	Ile	Glu	Ile	Thr	Cys	Val
								130		135		140			
Tyr	Cys	Lys	Thr	Val	Leu	Glu	Leu	Thr	Glu	Val	Phe	Glu	Phe	Ala	Phe
								145		150			155		160
Lys	Asp	Leu	Phe	Val	Val	Tyr	Arg	Asp	Ser	Ile	Pro	His	Ala	Ala	Cys
								165		170			175		
His	Lys	Cys	Ile	Asp	Phe	Tyr	Ser	Arg	Ile	Arg	Glu	Leu	Arg	His	Tyr
								180		185			190		
Ser	Asp	Ser	Val	Tyr	Gly	Asp	Thr	Leu	Glu	Lys	Leu	Thr	Asn	Thr	Gly
								195		200			205		
Leu	Tyr	Asn	Leu	Leu	Ile	Arg	Cys	Leu	Arg	Cys	Gln	Lys	Pro	Leu	Asn
								210		215			220		
Pro	Ala	Glu	Lys	Leu	Arg	His	Leu	Asn	Glu	Lys	Arg	Arg	Phe	His	Asn

225 230 235 240
Ile Ala Gly His Tyr Arg Gly Gln Cys His Ser Cys Cys Asn Arg Ala
245 250 255
Arg Gln Glu Arg Leu Gln Arg Arg Arg Glu Thr Gln Val Thr Ser Gly
260 265 270
His His His His His
275

<210> 22

<211> 1152

<212> DNA

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus
influenza B and E6E7 fusion from Human papilloma
virus type 18)

<400> 22

atggatccaa gcagccattc atcaaatatg gcgaataccc aaatgaaatc agacaaaatc 60
attattgctc accgtgggtgc tagcggttat ttaccagagc atacgttaga atctaaagca 120
cttgcgtttg cacaacaggc tgattattt gagaaggatt tagcaatgac taaggatgg 180
cgtttaatgg ttattcacga tcacttttta gatgggttga ctgatgtgc gaaaaaaattc 240
ccacatcgtc atcgtaaaga tggccgttac tatgtcatcg actttacctt aaaagaaatt 300
caaagtttag aatgacaga aaactttgaa accatggcgc gctttgagga tccaacacgg 360
cgaccctaca agctacctga tctgtgcacg gaactgaaca cttcaactgca agacatagaa 420
ataaacctgtg tatattgcaa gacagtattt gaaactacag aggtatttga atttgcattt 480
aaagattttat ttgtgggtgt a tagagacagt atacggcatg ctgtatgcca taaatgtata 540
gatttttattt ctagaattttag agaattaaga cattattttag actctgtgttga tggagacaca 600
ttggaaaaac taactaacac tgggttatac tatttattaa taaggtgcct gcggtgccag 660
aaaccgttga atccagcaga aaaactttaga caccctaatg aaaaacgacg atttcacaac 720
atagctgggc actatagagg ccagtgcctt cttgtgtgc accgagacacg acaggaacga 780
ctccaaacgac gcagagaaac acaagtaatc catggaccta aggcaacatt gcaagacatt 840
gtattgcatt tagagccccaa aatgaaattt ccgttgacc ttctatgtca cgagcaatta 900
agcgactcag aggaagaaaaa cgatgaaata gacggagttt atcatcaaca ttaccagcc 960
cgacgagccg aaccacaacg tcacacaatg ttgttatgt gttgtaaatg tgaagccaga 1020
atttagcttag tagtagaaag ctcagcagac gacccatcgag cattccagca gctgtttctg 1080
aacaccctgt cctttgtgtc tccgtgggtgt gcatcccagc agactagtgg ccaccatcac 1140
catcaccatt aa 1152

<210> 23

<211> 383

<212> PRT

<213> Artificial Sequence

<220>

<223> Chimaeric protein (protein D from Haemophilus influenza B and E6E7 fusion from Human papilloma virus type 18)

<400> 23

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
1										10				15	
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20					25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
				35				40				45			
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
					50			55			60				
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
					65			70		75			80		
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
					85			90			95				
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
					100			105			110				
Ala	Arg	Phe	Glu	Asp	Pro	Thr	Arg	Arg	Pro	Tyr	Lys	Leu	Pro	Asp	Leu
					115			120			125				
Cys	Thr	Glu	Leu	Asn	Thr	Ser	Leu	Gln	Asp	Ile	Glu	Ile	Thr	Cys	Val
					130			135			140				
Tyr	Cys	Lys	Thr	Val	Leu	Glu	Leu	Thr	Glu	Val	Phe	Glu	Phe	Ala	Phe
					145			150			155			160	
Lys	Asp	Leu	Phe	Val	Val	Tyr	Arg	Asp	Ser	Ile	Pro	His	Ala	Ala	Cys
					165			170			175				
His	Lys	Cys	Ile	Asp	Phe	Tyr	Ser	Arg	Ile	Arg	Glu	Leu	Arg	His	Tyr
					180			185			190				
Ser	Asp	Ser	Val	Tyr	Gly	Asp	Thr	Leu	Glu	Lys	Leu	Thr	Asn	Thr	Gly
					195			200			205				
Leu	Tyr	Asn	Leu	Leu	Ile	Arg	Cys	Leu	Arg	Cys	Gln	Lys	Pro	Leu	Asn
					210			215			220				
Pro	Ala	Glu	Lys	Leu	Arg	His	Leu	Asn	Glu	Lys	Arg	Arg	Phe	His	Asn
					225			230			235			240	
Ile	Ala	Gly	His	Tyr	Arg	Gly	Gln	Cys	His	Ser	Cys	Cys	Asn	Arg	Ala
					245			250			255				
Arg	Gln	Glu	Arg	Leu	Gln	Arg	Arg	Arg	Glu	Thr	Gln	Val	Met	His	Gly
					260			265			270				
Pro	Lys	Ala	Thr	Leu	Gln	Asp	Ile	Val	Leu	His	Leu	Glu	Pro	Gln	Asn

275 280 285
Glu Ile Pro Val Asp Leu Leu Cys His Glu Gln Leu Ser Asp Ser Glu
290 295 300
Glu Glu Asn Asp Glu Ile Asp Gly Val Asn His Gln His Leu Pro Ala
305 310 315 320
Arg Arg Ala Glu Pro Gln Arg His Thr Met Leu Cys Met Cys Cys Lys
325 330 335
Cys Glu Ala Arg Ile Glu Leu Val Val Glu Ser Ser Ala Asp Asp Leu
340 345 350
Arg Ala Phe Gln Gln Leu Phe Leu Asn Thr Leu Ser Phe Val Cys Pro
355 360 365
Trp Cys Ala Ser Gln Gln Thr Ser Gly His His His His His His
370 375 380

<210> 24

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 24

tccatgacgt tcctgacgtt 20

<210> 25

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 25

tctcccagcg tgcgccat 18

<210> 26

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 26

accgatgacg tcgcccgtga cggcaccacg

30